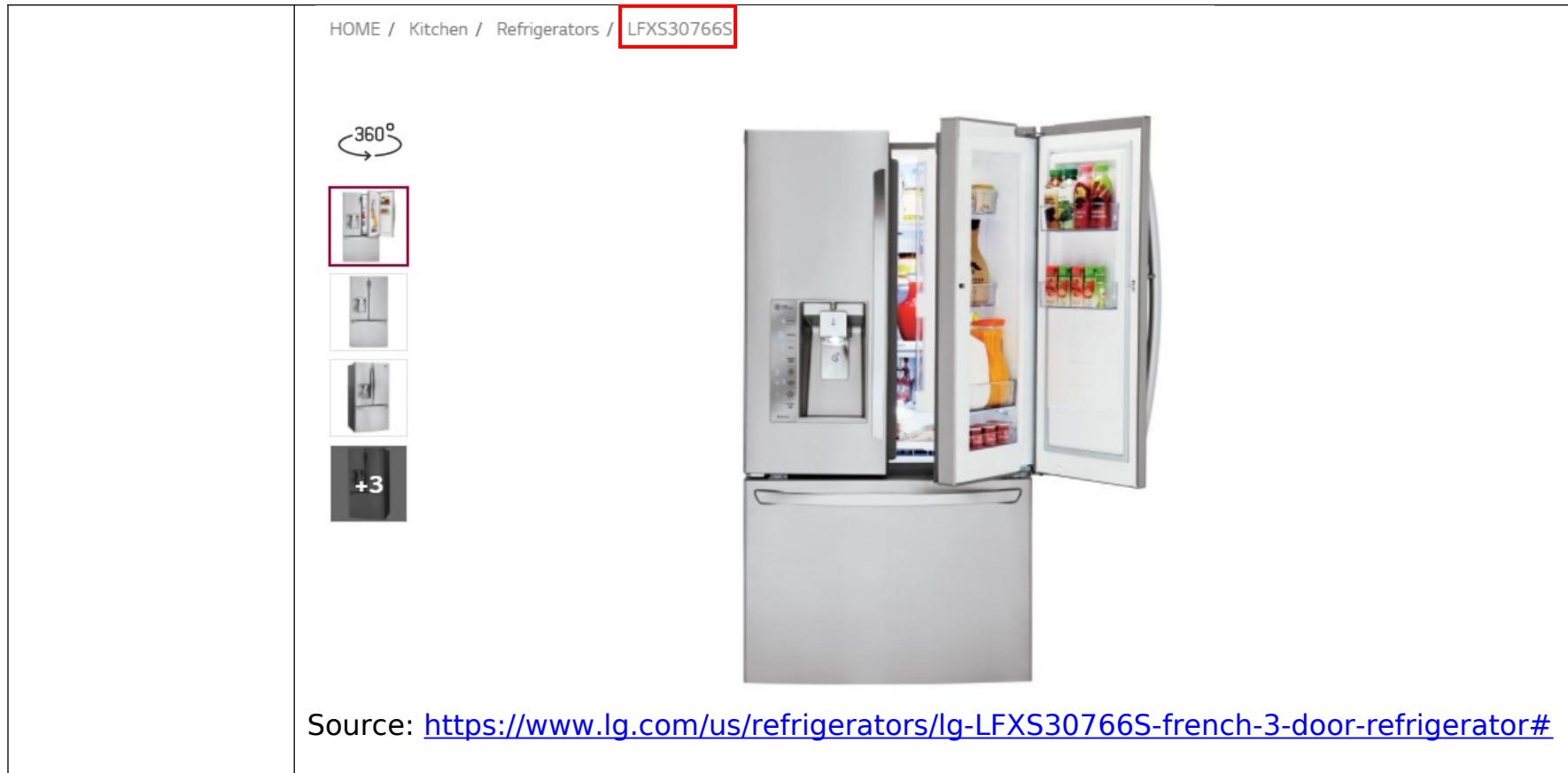


Exhibit 4

Claim	Analysis
<p>[1.1] A wireless communications system which includes an integrated monitoring circuit, the wireless communication system comprising:</p>	<p>To the extent preamble is limiting, LG Electronics (“Defendant”) makes, uses, sells and/or offers for sale a wireless communications system which includes an integrated monitoring circuit.</p> <p>This element is infringed literally, or in the alternative, under the doctrine of equivalents.</p> <p>For example, Defendant provides Smart Refrigerator LFXS30766S¹ which comprises inbuilt sensors in order to diagnose its internals for any malfunction. Further, LG ThinQ app is provided to connect to the Smart Refrigerator LFXS30766S using smartphone and diagnose its internals by using Smart Diagnosis option in the app. When Smart Diagnosis option is selected, a communication between server and Smart Refrigerator LFXS30766S is established to check for any possible errors and after diagnostic period is over, a message with alert is sent to the user if an error is found.</p>

¹ While Smart Refrigerator LFXS30766S has been used as an exemplary infringing product, all LG refrigerators including but not limited to LRMVC2306D, LRMVS3006S, SRFVC2406S, LSSB2692ST, LRFXS2503S, LRFVC2406S, LRFVS3006S, LMXS28596D, LFXC22596S, LFXS26973D, LFXC22526D, LFXS26596S, LMNS14420V, LMXS28626D, LSXC22396S, LSXS26396S and/or LSXC22426S as well as variants and versions of these products have same functionality. The presently charted exemplary infringing product is representative for purposes of illustrating infringement of the other LG devices.



SUMMARY	
Door Type	French 3-Door
SmartThinQ®	Yes
Total Capacity	29.6
ENERGY STAR® Qualified	Yes
SmartDiagnosis™	Yes
Source: https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#	
Refrigerator Type	Door-in-Door®
wi-fi Enabled	Yes
Ice & Water Dispenser	Yes
Standard Depth	Yes
ADA Compliant	Yes
Source: https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#	



The image shows the Google Play Store page for the LG ThinQ app. The app icon is a red circle containing a white house-like shape with a line extending from it. The app is developed by LG Electronics, Inc. and categorized as Lifestyle. It has a rating of 4.5 stars from 115,123 reviews. A note indicates compatibility with all devices. There are buttons for 'Add to Wishlist' and 'Install'. Below the main header, there are four preview images of the app's interface: 'LG ThinQ' (showing a family in a smart home), 'Manage Home' (showing a dashboard for managing products in rooms), 'Remote Control' (showing air purifier controls and air quality data), and 'Store' (showing offers and products). The source of the image is a link provided at the bottom of the page.

Source: https://play.google.com/store/apps/details?id=com.lgeha.nuts&hl=en_US



① 'Tap 'Smart Diagnosis' menu on the bottom.'

② 'Proceed by choosing "Wi-Fi Diagnosis" or "Audible Diagnosis".'

③ Check Smart Diagnosis results.

Source:
[http://download.lghomechat.com/manual/en/LG_HomeChat_Refriegerator_Manual.pdf](http://download.lghomechat.com/manual/en/LG_HomeChat_Refrigerator_Manual.pdf),
page 18

	<h2>LG Range - What is Smart Diagnosis & How to Use it</h2> <p>[Narrator]</p> <p>Welcome to the LG customer support channel.</p> <p>Your LG smart range comes equipped with a smart diagnosis system.</p> <p>In this video we'll explain what smart diagnosis is, and how you can use it with your smartphone.</p> <p>The smart diagnosis system or STS allows you to troubleshoot your clients without the need to call and schedule a visit from the service technician.</p> <p>SDS equipped appliances can transmit an audible digital signal that our smart phone app can record and analyze.</p> <p>The diagnosis signal can be transmitted and analyzed over Wi-Fi as well.</p> <p>After diagnosis, the phone app will provide you with troubleshooting steps based on the information transmitted by the appliance.</p> <p>If you notice anything unusual about your new range or feel that it's not performing as it should you can use the STS to check for any errors without having to place a call to the service center.</p> <p>To perform the diagnosis, you'll have 2 options.</p> <p>A Wi-Fi Diagnosis, or an Audible Diagnosis.</p> <p>When performing either method, make sure that the range is not in use and that the unit is cooled to room temperature.</p> <p>First, the Wi-Fi option.</p> <p>This option is the easiest method of the 2.</p> <p>The signal from your smart range is transmitted over your home wireless network and our servers analyze the signal to diagnose any issues and then relay that information to your smart phone app.</p> <p>Source: https://www.lg.com/us/support/video-tutorials/lg-range-what-is-smart-diagnosis-how-to-use-it-CT00000303-1367417179055</p> <p>Further, to the extent this element is performed at least in part by Defendant's software source code, Plaintiff shall supplement these contentions pursuant to production of such source code by the Defendant.</p>
[1.2] (a) a setup circuit for configuring and enabling a monitor mode for a wireless communications transmitter;	<p>Defendant provides a setup circuit for configuring and enabling a monitor mode for a wireless communications transmitter.</p> <p>This element is infringed literally, or in the alternative, under the doctrine of equivalents.</p> <p>For example, Defendant's Smart Refrigerator LFXS30766S ("wireless communications transmitter") comprises a circuit which allows user to enable the Smart Diagnosis mode ("monitor mode") through ThinQ app. When user selects the option of Smart Diagnosis, sensors in the Smart Refrigerator LFXS30766S starts diagnosing its internals to check for any malfunction.</p>

SUMMARY	
Door Type	French 3-Door
SmartThinQ®	Yes
Total Capacity	29.6
ENERGY STAR® Qualified	Yes
SmartDiagnosis™	Yes
Source: https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#	
Refrigerator Type	Door-in-Door®
wi-fi Enabled	Yes
Ice & Water Dispenser	Yes
Standard Depth	Yes
ADA Compliant	Yes
Source: https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#	



LG ThinQ

LG Electronics, Inc. Lifestyle

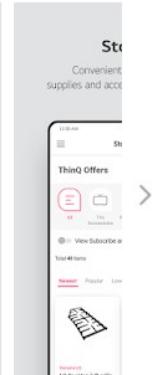
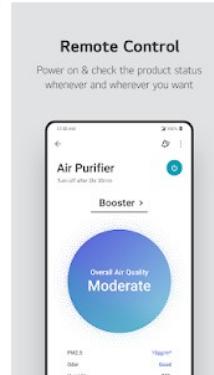
★★★★★ 115,123

3+

This app is compatible with all of your devices.

Add to Wishlist

Install



Source: https://play.google.com/store/apps/details?id=com.lgeha.nuts&hl=en_US



① 'Tap 'Smart Diagnosis' menu on the bottom.

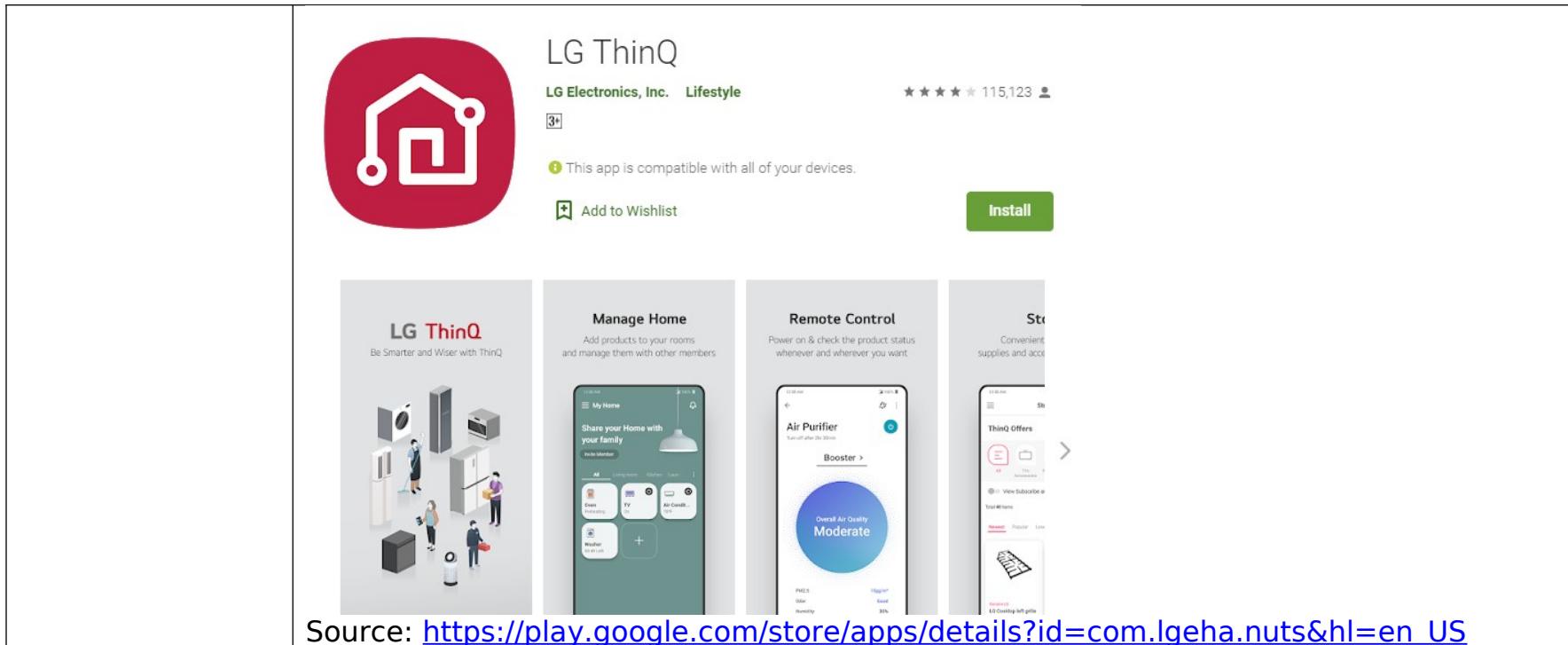
② 'Proceed by choosing "Wi-Fi Diagnosis" or "Audible Diagnosis".

③ Check Smart Diagnosis results.

Source:
http://download.lghomechat.com/manual/en/LG_HomeChat_Refrigerator_Manual.pdf,
page 18

	<h2>LG Range - What is Smart Diagnosis & How to Use it</h2> <p>[Narrator]</p> <p>Welcome to the LG customer support channel.</p> <p>Your LG smart range comes equipped with a smart diagnosis system.</p> <p>In this video we'll explain what smart diagnosis is, and how you can use it with your smartphone.</p> <p>The smart diagnosis system or STS allows you to troubleshoot your clients without the need to call and schedule a visit from the service technician.</p> <p>SDS equipped appliances can transmit an audible digital signal that our smart phone app can record and analyze.</p> <p>The diagnosis signal can be transmitted and analyzed over Wi-Fi as well.</p> <p>After diagnosis, the phone app will provide you with troubleshooting steps based on the information transmitted by the appliance.</p> <p>If you notice anything unusual about your new range or feel that it's not performing as it should you can use the STS to check for any errors without having to place a call to the service center.</p> <p>To perform the diagnosis, you'll have 2 options.</p> <p>A Wi-Fi Diagnosis, or an Audible Diagnosis.</p> <p>When performing either method, make sure that the range is not in use and that the unit is cooled to room temperature.</p> <p>First, the Wi-Fi option.</p> <p>This option is the easiest method of the 2.</p> <p>The signal from your smart range is transmitted over your home wireless network and our servers analyze the signal to diagnose any issues and then relay that information to your smart phone app.</p> <p>Source: https://www.lg.com/us/support/video-tutorials/lg-range-what-is-smart-diagnosis-how-to-use-it-CT00000303-1367417179055</p> <p>Further, to the extent this element is performed at least in part by Defendant's software source code, Plaintiff shall supplement these contentions pursuant to production of such source code by the Defendant.</p>
<p>[1.3] (b) a detection routine executing on an Internet based server for detecting sensory data signals transmitted by said wireless communications transmitter and originating from a monitored area</p>	<p>Defendant provides a detection routine executing on an Internet based server for detecting sensory data signals transmitted by said wireless communications transmitter and originating from a monitored area when said monitor mode is enabled.</p> <p>This element is infringed literally, or in the alternative, under the doctrine of equivalents.</p> <p>For example, Defendant's Smart Refrigerator LFXS30766S ("wireless communications transmitter") comprises sensors in order to diagnose its internals ("monitored area") for any malfunction. When Smart Diagnosis option is selected, a communication between server and Smart Refrigerator LFXS30766S is established to check for any possible errors. Sensor data from Smart Refrigerator LFXS30766S is sent to the server where it is analysed and processed ("detection routine executing on an Internet based</p>

when said monitor mode is enabled;	<p>server") and a message with an alert is sent to the user if any error is found.</p> <p>SUMMARY</p> <table> <tbody> <tr> <td>Door Type</td><td>French 3-Door</td></tr> <tr> <td>SmartThinQ®</td><td>Yes</td></tr> <tr> <td>Total Capacity</td><td>29.6</td></tr> <tr> <td>ENERGY STAR® Qualified</td><td>Yes</td></tr> <tr> <td>SmartDiagnosis™</td><td>Yes</td></tr> </tbody> </table> <p>Source: https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#</p> <table> <tbody> <tr> <td>Refrigerator Type</td><td>Door-in-Door®</td></tr> <tr> <td>wi-fi Enabled</td><td>Yes</td></tr> <tr> <td>Ice & Water Dispenser</td><td>Yes</td></tr> <tr> <td>Standard Depth</td><td>Yes</td></tr> <tr> <td>ADA Compliant</td><td>Yes</td></tr> </tbody> </table> <p>Source: https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#</p>	Door Type	French 3-Door	SmartThinQ®	Yes	Total Capacity	29.6	ENERGY STAR® Qualified	Yes	SmartDiagnosis™	Yes	Refrigerator Type	Door-in-Door®	wi-fi Enabled	Yes	Ice & Water Dispenser	Yes	Standard Depth	Yes	ADA Compliant	Yes
Door Type	French 3-Door																				
SmartThinQ®	Yes																				
Total Capacity	29.6																				
ENERGY STAR® Qualified	Yes																				
SmartDiagnosis™	Yes																				
Refrigerator Type	Door-in-Door®																				
wi-fi Enabled	Yes																				
Ice & Water Dispenser	Yes																				
Standard Depth	Yes																				
ADA Compliant	Yes																				





The image consists of three screenshots of the LG Smart Refrigerator app, specifically the Smart Diagnosis feature. The first screenshot shows the main menu with a 'Smart Diagnosis' button highlighted. The second screenshot shows the 'Smart Diagnosis' screen with a red cross icon and a message about dispensing less than recommendations after installation. The third screenshot shows the 'Result 1' screen with a message about a water dispenser system not being purged after installation, and a note to dispense water for about five minutes in thirty-second intervals. At the bottom, there are contact numbers for the service center.

① 'Tap 'Smart Diagnosis' menu on the bottom.'

② 'Proceed by choosing "Wi-Fi Diagnosis" or "Audible Diagnosis".'

③ Check Smart Diagnosis results.

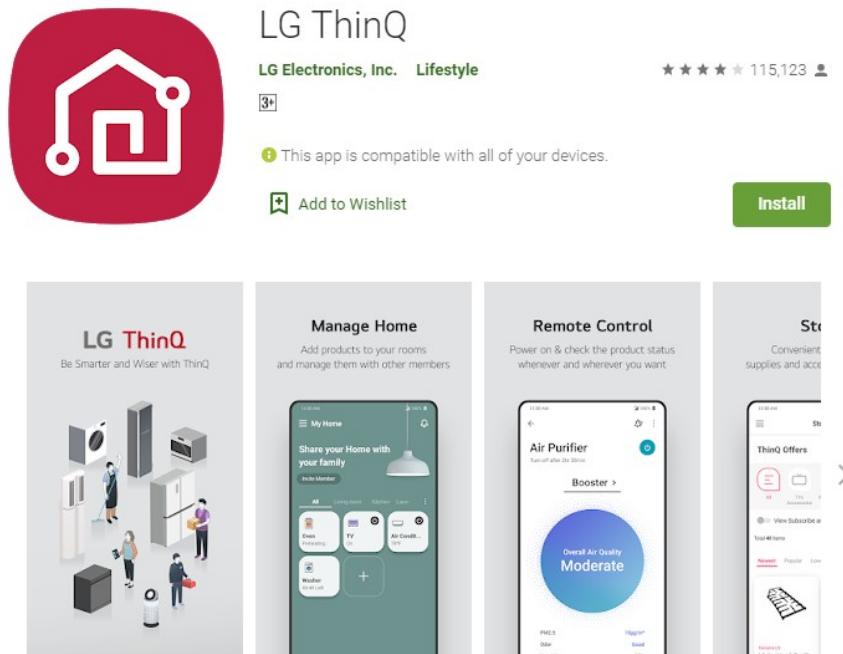
Source:
http://download.lghomechat.com/manual/en/LG_HomeChat_Refrigerator_Manual.pdf,
page 18

	<h2>LG Range - What is Smart Diagnosis & How to Use it</h2> <p>[Narrator]</p> <p>Welcome to the LG customer support channel.</p> <p>Your LG smart range comes equipped with a smart diagnosis system.</p> <p>In this video we'll explain what smart diagnosis is, and how you can use it with your smartphone.</p> <p>The smart diagnosis system or STS allows you to troubleshoot your clients without the need to call and schedule a visit from the service technician.</p> <p>SDS equipped appliances can transmit an audible digital signal that our smart phone app can record and analyze.</p> <p>The diagnosis signal can be transmitted and analyzed over Wi-Fi as well.</p> <p>After diagnosis, the phone app will provide you with troubleshooting steps based on the information transmitted by the appliance.</p> <p>If you notice anything unusual about your new range or feel that it's not performing as it should you can use the STS to check for any errors without having to place a call to the service center.</p> <p>To perform the diagnosis, you'll have 2 options.</p> <p>A Wi-Fi Diagnosis, or an Audible Diagnosis.</p> <p>When performing either method, make sure that the range is not in use and that the unit is cooled to room temperature.</p> <p>First, the Wi-Fi option.</p> <p>This option is the easiest method of the 2.</p> <p>The signal from your smart range is transmitted over your home wireless network and our servers analyze the signal to diagnose any issues and then relay that information to your smart phone app.</p> <p>Source: https://www.lg.com/us/support/video-tutorials/lg-range-what-is-smart-diagnosis-how-to-use-it-CT00000303-1367417179055</p> <p>Further, to the extent this element is performed at least in part by Defendant's software source code, Plaintiff shall supplement these contentions pursuant to production of such source code by the Defendant.</p>
<p>[1.4] (c) a set of selectable monitor mode control options, which options include a user selectable threshold required for an alert to be triggered, wherein said monitor mode includes an option for controlling the detection circuit to enable said monitor mode only during a specified period, which begins at a first time and lasts for a first time duration, further wherein monitor mode control options permit a user to receive alerts over a low bandwidth text-based communications network.</p> <p>This element is infringed literally, or in the alternative, under the doctrine of equivalents.</p> <p>For example, Defendant's Smart Refrigerator LFXS30766S connected with ThinQ app, provides user an option to perform Smart Diagnosis. Smart Diagnosis gives two options to choose from - Wi-Fi Diagnosis and Audible Diagnosis - in order to diagnose the</p>	

<p>includes an option for controlling the detection circuit to enable said monitor mode only during a specified period, which begins at a first time and lasts for a first time duration; further wherein monitor mode control options permit a user to receive alerts over a low bandwidth text-based communications network;</p>	<p>internals of the Smart Refrigerator LFXS30766S. Upon information and belief, when user selects one of the two options, a threshold is selected to be compared to the sensor data from Smart Refrigerator LFXS30766S so that an alert is generated if sensor data is more than the threshold value.</p> <p>Further, the Smart diagnosis runs for a limited period during which complete diagnosis of internals of Smart Refrigerator LFXS30766S through inbuilt sensors is finished. If some error is detected, the user receives alerts in the ThinQ app over a message-based network.</p> <p>SUMMARY</p> <table data-bbox="532 714 1205 1008"> <tbody> <tr> <td>Door Type</td><td>French 3-Door</td></tr> <tr> <td>SmartThinQ®</td><td>Yes</td></tr> <tr> <td>Total Capacity</td><td>29.6</td></tr> <tr> <td>ENERGY STAR® Qualified</td><td>Yes</td></tr> <tr> <td>SmartDiagnosis™</td><td>Yes</td></tr> </tbody> </table> <p>Source: https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#</p>	Door Type	French 3-Door	SmartThinQ®	Yes	Total Capacity	29.6	ENERGY STAR® Qualified	Yes	SmartDiagnosis™	Yes
Door Type	French 3-Door										
SmartThinQ®	Yes										
Total Capacity	29.6										
ENERGY STAR® Qualified	Yes										
SmartDiagnosis™	Yes										

Refrigerator Type	Door-in-Door®
Wi-Fi Enabled	Yes
Ice & Water Dispenser	Yes
Standard Depth	Yes
ADA Compliant	Yes

Source: <https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#>



Source: https://play.google.com/store/apps/details?id=com.lgeha.nuts&hl=en_US



① 'Tap 'Smart Diagnosis' menu on the bottom.

② 'Proceed by choosing "Wi-Fi Diagnosis" or "Audible Diagnosis".

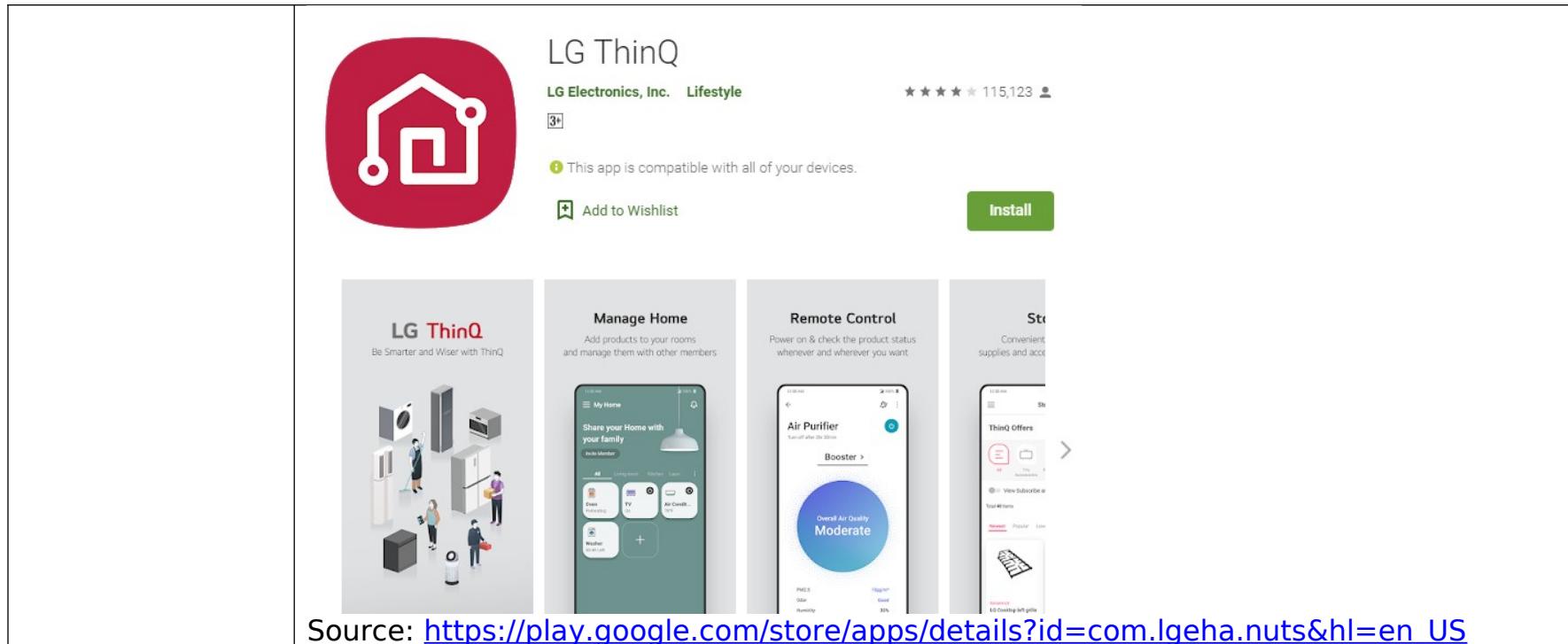
③ Check Smart Diagnosis results.

Source:

http://download.lghomechat.com/manual/en/LG_HomeChat_Refigerator_Manual.pdf,
page 18

	<h2>LG Range - What is Smart Diagnosis & How to Use it</h2> <p>[Narrator]</p> <p>Welcome to the LG customer support channel.</p> <p>Your LG smart range comes equipped with a smart diagnosis system.</p> <p>In this video we'll explain what smart diagnosis is, and how you can use it with your smartphone.</p> <p>The smart diagnosis system or STS allows you to troubleshoot your clients without the need to call and schedule a visit from the service technician.</p> <p>SDS equipped appliances can transmit an audible digital signal that our smart phone app can record and analyze.</p> <p>The diagnosis signal can be transmitted and analyzed over Wi-Fi as well.</p> <p>After diagnosis, the phone app will provide you with troubleshooting steps based on the information transmitted by the appliance.</p> <p>If you notice anything unusual about your new range or feel that it's not performing as it should you can use the STS to check for any errors without having to place a call to the service center.</p> <p>To perform the diagnosis, you'll have 2 options.</p> <p>A Wi-Fi Diagnosis, or an Audible Diagnosis.</p> <p>When performing either method, make sure that the range is not in use and that the unit is cooled to room temperature.</p> <p>First, the Wi-Fi option.</p> <p>This option is the easiest method of the 2.</p> <p>The signal from your smart range is transmitted over your home wireless network and our servers analyze the signal to diagnose any issues and then relay that information to your smart phone app.</p> <p>Source: https://www.lg.com/us/support/video-tutorials/lg-range-what-is-smart-diagnosis-how-to-use-it-CT00000303-1367417179055</p> <p>Further, to the extent this element is performed at least in part by Defendant's software source code, Plaintiff shall supplement these contentions pursuant to production of such source code by the Defendant.</p>
[1.5] (d) an alert generator circuit for generating an alert when said sensory data exceeds said user selectable threshold and when said monitor mode is enabled.	<p>Defendant provides an alert generator circuit for generating an alert when said sensory data exceeds said user selectable threshold and when said monitor mode is enabled.</p> <p>This element is infringed literally, or in the alternative, under the doctrine of equivalents.</p> <p>For example, when Smart Diagnosis is run ("monitor mode is enabled"), the data from the sensors in Smart Refrigerator LFXS30766S is sent over to the server where it is analysed and processed (compared to threshold) and an alert is generated if the sensor data is out of the safety limit. The alert is sent to the user through the ThinQ app.</p>

SUMMARY	
Door Type	French 3-Door
SmartThinQ®	Yes
Total Capacity	29.6
ENERGY STAR® Qualified	Yes
SmartDiagnosis™	Yes
Source: https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#	
Refrigerator Type	Door-in-Door®
Wi-Fi Enabled	Yes
Ice & Water Dispenser	Yes
Standard Depth	Yes
ADA Compliant	Yes
Source: https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#	



The image consists of three screenshots of the LG Smart Refrigerator app, specifically the Smart Diagnosis feature. The first screenshot shows the main menu with a 'Smart Diagnosis' button highlighted. The second screenshot shows the 'Smart Diagnosis' screen with a red cross icon and a message about dispensing less than recommendations after installation. The third screenshot shows the 'Result 1' screen with a list of troubleshooting steps for a water dispenser issue.

① 'Tap 'Smart Diagnosis' menu on the bottom.'

② 'Proceed by choosing "Wi-Fi Diagnosis" or "Audible Diagnosis".'

③ Check Smart Diagnosis results.

Source:
http://download.lghomechat.com/manual/en/LG_HomeChat_Refrigerator_Manual.pdf,
page 18

LG Range - What is Smart Diagnosis & How to Use it

[Narrator]

Welcome to the LG customer support channel.

Your LG smart range comes equipped with a smart diagnosis system.

In this video we'll explain what smart diagnosis is, and how you can use it with your smartphone.

The smart diagnosis system or STS allows you to troubleshoot your clients without the need to call and schedule a visit from the service technician.

SDS equipped appliances can transmit an audible digital signal that our smart phone app can record and analyze.

The diagnosis signal can be transmitted and analyzed over Wi-Fi as well.

After diagnosis, the phone app will provide you with troubleshooting steps based on the information transmitted by the appliance.

If you notice anything unusual about your new range or feel that it's not performing as it should you can use the STS to check for any errors without having to place a call to the service center.

To perform the diagnosis, you'll have 2 options.

A Wi-Fi Diagnosis, or an Audible Diagnosis.

When performing either method, make sure that the range is not in use and that the unit is cooled to room temperature.

First, the Wi-Fi option.

This option is the easiest method of the 2.

The signal from your smart range is transmitted over your home wireless network and our servers analyze the signal to diagnose any issues and then relay that information to your smart phone app.

Source: <https://www.lg.com/us/support/video-tutorials/lg-range-what-is-smart-diagnosis-how-to-use-it-CT00000303-1367417179055>

Further, to the extent this element is performed at least in part by Defendant's software source code, Plaintiff shall supplement these contentions pursuant to production of such source code by the Defendant.

1. List of References

1. Smart Refrigerator LFXS30766S, <https://www.lg.com/us/refrigerators/lg-LFXS30766S-french-3-door-refrigerator#>, last accessed on October 1, 2020.
2. ThinQ App, https://play.google.com/store/apps/details?id=com.lgeha.nuts&hl=en_US, last accessed on October 1, 2020.
3. Smart Diagnosis, http://download.lghomechat.com/manual/en/LG_HomeChat_Refrigerator_Manual.pdf , last accessed on October 1, 2020.
4. Working of Smart Diagnosis, <https://www.lg.com/us/support/video-tutorials/lg-range-what-is-smart-diagnosis-how-to-use-it-CT00000303-1367417179055>, last accessed on October 1, 2020.